



## Subject card

Subject name and code	Heat and mass transport, PG_00064916						
Field of study	Mechanical Engineering						
Date of commencement of studies	February 2025		Academic year of realisation of subject		2024/2025		
Education level	second-cycle studies		Subject group		Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
Mode of study	Part-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	1		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Zakład Ekoinżynierii i Silników Spalinowych -> Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Bartosz Dawidowicz				
	Teachers		dr inż. Bartosz Dawidowicz				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	18.0	9.0	0.0	0.0	0.0	27
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	27		8.0		65.0	100
Subject objectives	Presentation of theoretical basics of heat and mass transfer processes.Paying attention to the analogy ofheat and mass transfer processes. Supporting theoretical considerations with examples of calculations.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U11] communicates and justifies opinions on specialized topics in a manner understandable to diverse audiences, including the use of modern techniques, including information technology		The student is familiar with phenomena occurring in heat and mass transport and is able to explain them.		[SU3] Assessment of ability to use knowledge gained from the subject		
	[K7_W03] demonstrates a well-structured and theoretically grounded knowledge of the key issues in Mechanical Engineering to enable the design and diagnosis of mechanical systems, processes and devices		The student is able to perform heat and mass transfer calculations.		[SW1] Assessment of factual knowledge		
	[K7_W11] interprets social, economic, legal (including industrial and intellectual property laws), and other non-technical aspects of engineering activities, and includes them into engineering practice		The student recognizes and explains phenomena occurring in heat and mass exchange and their impact on the environment.		[SW1] Assessment of factual knowledge		
	[K7_K12] is ready for fullfiling social commitment and initiation of actions for public interest including entrepreneurial thinking and acting		The student is able to design a heat exchanger.		[SK5] Assessment of ability to solve problems that arise in practice		
Subject contents	<b>A. Heat transfer:</b> 1. Conduction, convection, radiation, 2. Common heat transfer, 3. Heat transfer with phase change, 4. Heat exchangers <b>B. Mass transfer:</b> 1. Diffusion, convection,2. Analogy between heat and mass transfer, 3. Simultaneous heat and mass tarnser						
Prerequisites and co-requisites	Applied thermodynamics, heat transfer						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture	56.0%	50.0%
	Numerical exercises	56.0%	50.0%
Recommended reading	Basic literature	1.Bergman T.L., Lavine A.S., Incropera F.P., Dewitt D.P.: Fundamentals of heat and mass transfer, J. Wiley&Sons, 2011, 2.Bird R.B., Stewart W.E., Lightfoot E.N.: Transport phenomena, John Wiley&Sons, 1960, 3.Kreith F., Manglik R.M., Bohn M.S., Tiwari S.: Principles of heat transfer, Cengage Learning, 2011, 4.Serth R.W., Lestina T.G.: Process heat transfer, Elsevier, 2014, 5.Gupta J.P.: Heat exchanger and pressure, Hemisphere Publishing Corporation, 1986.	
	Supplementary literature	1. Brodowicz K.: Wymienniki ciepła i masy, Wydawn. PW, 1980	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	1. Diffusion mechanism of heat and mass transport.. 2. Equation of conservation of energy and mass. 3. Thermal and concentration boundary layers. 4. Lewis law. 5. Lewis number. 6. Peclet's law. Mean log temperature.		
Work placement	Not applicable		

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